

REMARKS

In the March 12, 2003 Office Action, the Examiner noted that claims 1-15 were pending in the application; objected to claims 7, 8 and 12-15 and refused to consider the limitations recited therein; and rejected claims 1-6 and 9 under 35 U.S.C. § 103. In rejecting the claims, U.S. Patents 6,334,690 to Ohkawa and 5,719,649 to Shono et al. (References A and B, respectively) were cited. Claim 16-21 have been added and thus, claims 1-21 remain in the case. The Examiner's rejections are traversed below.

The Invention

The present invention is directed to a light guide plate used to illuminate a liquid crystal display. As illustrated in, e.g., Figs. 7-10, a plurality of micro-reflectors are arranged on a back face of the light guide plate to redirect light input from a side end face to a major emission face. As illustrated in Figs. 5(a)-(b), each micro-reflector has two slopes. An incident light beam H1 first reflects with a low incidence angle at point b and then reflects with a higher incidence angle at point c to be directed through the emission face.

The Prior Art

U.S. Patent 6,334,690 to Ohkawa

The Ohkawa '690 patent is directed to a surface light source device for a liquid crystal display. Instead of micro-reflectors, the back face 2B (Fig. 1) "is provided with projection rows" (column 6, lines 19-20) and further direction correction is provided by prism sheet 5 on the exterior of the emission face 2C (see column 6, lines 20-21).

U.S. Patent 5,719,649 to Shono et al.

The Shono et al. patent is directed to a light guide for a liquid crystal display device. In the embodiments illustrated in Figs. 9 and 11, reflecting surfaces 915a (Fig. 11) are formed on the back face of light guide 911. As illustrated in Fig. 11, light incident on surface 915a reflects once off surface 915a which has an angle of θ_3 from the horizontal.

Claim Objections

In the first two paragraphs on page 2 of the Office Action, the Examiner objected to claims 7, 8 and 12-14, because claims 7, 8, 12 and 13 were multiple dependent claims depending from multiple dependent claims. Claims 7, 8, 12 and 13 have been amended to

remove their dependence from claim 6 and 11 which were the only multiple dependent claims from which they depended. Therefore, claims 7, 8, 12 and 13 are now in proper form. Withdrawal of the objection and examination of claims 7, 8, and 12-15 is respectfully requested.

Rejections under 35 U.S.C. 103

From the next to last paragraph on page 2 through the last paragraph on page 3, claims 1-6 and 9 were rejected under 35 U.S.C. 103(a) as unpatentable over Ohkawa '690 in view of Shono et al. As discussed above, neither Ohkawa, nor Shono et al. teach or suggest a light guide having a "back face ... provided with ... micro-reflectors" (e.g., claim 1, line 6) each of which "includes a first slope and a second slope" e.g., claim 1, line 7) where "output light [is] directed to said emission face by a pair of inner reflections effected by said first slope and then effected by said second slope" (e.g., claim 1, last three lines). As discussed above, there are no micro-reflectors in the device taught by Ohkawa '690, while the micro-reflectors taught by Shono et al. have only one reflective slope. The embodiment illustrated in Fig. 2 which was cited in rejecting the claims has micro-reflectors on the emission face, not the back face and only surface 41 is reflective. As illustrated in Fig. 2, light is emitted through the surface parallel to surface 42 in the next "notch". In the embodiment illustrated in Figs. 9 and 11 which has reflective surfaces on the back face, only surface 915a reflects light; "it is desirable that the other surface 915b of the second projection row 915 be fabricated such that light source light propagated inside the light guide 911 is not reflected" (column 12, lines 42-45).

In addition, the independent claims recite "said first slope being inclined with respect to an extending plane of said emission face more gently as compared with said second slope" (e.g., claim 1, lines 8-9). Since the prior art does not teach two different reflective slopes, there is no suggestion of this additional limitation. Even if surface 915b was reflective, light directed from the right side of Fig. 11 and reflected off of surface 915b and then 915a to be emitted through the opposite side of light guide 911, would be reflecting off surfaces with slopes that would be contrary to the previously quoted limitation.

Thus, neither of the prior art references used in rejecting the claims teach or suggest the limitations quoted above from claim 1. Similar limitations are recited in the other independent claims. Therefore, it is submitted that claims 1-15 patentable distinguish over Ohkawa '690 in view of Shono et al.

On page 3, line 4 of the Office Action, the statement "[i]t is understood that micro-reflectors can obtain any desired orientation depending on necessity" was made. Nothing in the cited prior art supports this statement. If the claims continue to be rejected, the Examiner is

respectfully requested to cite a prior art reference supporting this statement, or provide an affidavit of personal knowledge in accordance with MPEP § 2144.03. Until such support for the statement is provided, it is submitted that the additional limitations recited in claims 2, 6-8, 10 and 11 further patentably distinguish over Ohkawa '690 in view of Shono et al.

New Claims

Claims 16-21 have been added to provide dependent claims corresponding to the improper multiple-dependent claims that were removed by amendment in response to the claim objections. It is submitted that claims 16-21 patentably distinguish over the prior art for the reasons discussed above with respect to the independent claims and that claims 20 and 21 further patentably distinguish over the prior art due to the varying orientation of the micro-reflectors which, as discussed above, is not supported by the prior art cited in rejecting the claims.

Summary

It is submitted that the references cited by the Examiner, taken individually or in combination, do not teach or suggest the features of the present claimed invention. Thus, it is submitted that claims 1-21 are in a condition suitable for allowance. Reconsideration of the claims and an early Notice of Allowance are earnestly solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: 9/12/03

By: Richard A. Gollhofer
Richard A. Gollhofer
Registration No. 31,106

1201 New York Avenue, NW, Suite 700
Washington, D.C. 20005
Telephone: (202) 434-1500
Facsimile: (202) 434-1501